CLAIMS

1. A wireless transmission apparatus comprising:

at least one transmission antenna; and

a transmission section that transmits a preamble signal and a data signal via the at least one transmission antenna,

wherein the transmission section uses a preamble subcarrier allocated per transmission antenna to transmit the preamble signal and uses a data subcarrier having a frequency different from the preamble subcarrier to transmit the data signal.

2. The wireless transmission apparatus according to claim 1, further comprising a detection section that detects an idle signature subcarrier out of a plurality of signature subcarriers that are used to transmit a signature signal and have frequencies different from the data subcarrier,

wherein, when transmitting the data signal, the transmission section transmits the signature signal using the idle signature subcarrier detected.

3. The wireless transmission apparatus according to claim 2, wherein:

the number of the plurality of signature subcarriers corresponds to the total number of transmission antennas

that can transmit the data signal in parallel to a wireless reception apparatus to which the data signal is addressed; and

the detection section detects at least one idle signature subcarrier out of the plurality of signature subcarriers.

4. The wireless transmission apparatus according to claim 3, wherein the transmission section transmits the preamble signal before transmitting the data signal.

5. The wireless transmission apparatus according to claim 3, wherein:

the plurality of signature subcarriers each belong to one of a plurality of subcarrier groups, the number of the plurality of subcarrier groups being equal to or less than the total number of the transmission antennas;

the transmission antenna comprises a plurality of transmission antennas;

the detection section detects at least one idle subcarrier group out of the plurality of subcarrier groups; and

the transmission section transmits the data signals via an equal or smaller number of transmission antennas than the at least one idle subcarrier group detected, out of the plurality of transmission antennas.

6. The wireless transmission apparatus according to claim 5, wherein the transmission section transmits the signature signal using signature subcarriers belonging to a same number of subcarrier groups as the transmission antennas used to transmit the data signal.

7. The wireless transmission apparatus according to claim 4, wherein the transmission section transmits the preamble signal using a preamble subcarrier having the same frequency as the idle signature subcarrier detected.

8. The wireless transmission apparatus according to claim 3, wherein:

the number of the plurality of signature subcarriers is equal to or less than the total number of the transmission antennas;

the transmission antenna comprises a plurality of transmission antennas;

the detection section detects at least one idle signature subcarrier out of the plurality of signature subcarriers; and

the transmission section transmits the data signal via an equal or smaller number of transmission antennas than the at least one signature subcarrier detected.

9. The wireless transmission apparatus according to claim 4, wherein:

the detection section detects a usage state of the preamble subcarrier; and

the transmission section transmits the preamble signal when the preamble subcarrier is detected to be idle.

10. The wireless transmission apparatus according to claim 8, wherein the transmission section starts transmitting the signature signal when starting transmitting the preamble signal.

11. The wireless transmission apparatus according to claim 8, wherein the transmission section transmits the signature signal using the same number of signature subcarriers as the transmission antennas used to transmit the data signal.

12. The wireless transmission apparatus according to claim 3, wherein the transmission section completes transmitting the signature signal when completing transmitting the data signal.

13. The wireless transmission apparatus according to claim 3, wherein the transmission section continues transmitting the signature signal during a period the data signal is transmitted.

14. The wireless transmission apparatus according to claim 3, wherein the transmission section defers transmitting the data signal when an insufficient number of idle signature subcarriers are detected.

15. The wireless transmission apparatus according to claim 4, wherein, when the detection section detects an idle signature subcarrier, the transmission section performs predetermined backoff processing before transmitting the preamble signal.

16. The wireless transmission apparatus according to claim 15, further comprising a determination section that determines a state of medium communicating to the wireless reception apparatus the data signal transmitted by the transmission section,

wherein the transmission section switches a decrement time unit of in backoff processing according to the state of the medium determined.

17. A wireless communication network system comprising the wireless transmission apparatus according of claim 1.

18. A wireless transmission method comprising a transmission step of transmitting a preamble signal and a data signal via at least one transmission antennas,

wherein the transmission step comprises:

a preamble transmission step of transmitting the preamble signal using a preamble subcarrier allocated per transmission antenna; and

a data transmission step of transmitting the data signal using a data subcarrier having a frequency different from the preamble subcarrier.